National Training Facility for Hydrogen Safety at the HAMMER Site

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Overview of Presentation

- Introduction – National Training Facility for Hydrogen Safety at HAMMER
- What is HAMMER?
- Where is it?
- HAMMER History
- HAMMER Facilities and Props
- 2003 HAMMER Training Statistics
- Neighbors, Customers, and Partners

Overview of Presentation (continued)

- Vision for Training Facility
- Target Audiences for Safety Training
- Draft Five-Year Roadmap
- Three Conceptual Prop Systems
- Seeking Input
- Conclusions
- Closing Thoughts
- Contacting Us

Introduction

- Could the hydrogen economy fail to materialize because stakeholders are afraid of hydrogen?

- Our planned approach --- provide a hands-on opportunity for stakeholders to:
  - work with realistic hydrogen props
  - become familiar with hydrogen's characteristics
  - learn how to handle potential emergencies

- National Training Facility for Hydrogen Safety makes sense, especially at HAMMER, where "Training is as real as it gets!"

The Volpentest

HAMMER

Training Center

Training as Real as it Gets!

HAMMER?

HAzardous

Materials

Management and

Emergency

Response

Hanford Site Location Map
Washington State
D/DR
H
N
F
KW/KE
B/C
100 Areas
Columbia River
200 West Area
200 East Area
Rattlesnake Mt.
400 Area
HAMMER
Hanford Site
586 Square Miles
Boeing Animation

HAMMER History

- Began as a grass roots initiative by local fire chiefs who saw a need for a regional training center
- Congress approved $29.9M line item project in 1994
- Construction began in July 1995 and was completed in September 1997
- HAMMER was named for Tri-City community leader Sam Volpentest

HAMMER Facilities and Props

- 80-Acre Main Campus
- 75-Acre Expansion Area
- 18 Classrooms
- 2 Computer-Based Training Centers
- 2 Conference Rooms
- Library
- 4 Indoor Open-Bay Areas
- 29 Outdoor Training Props
- Satellite/Distance Learning Capabilities
- Staff Offices
- Restaurant

Training Statistics

- In 2003 HAMMER hosted -
  - Over 34,000 students
  - Over 2,400 classes
  - Over 44,000 student-days
  - 50 off-site classes with over 1,400 students
- HAMMER currently hosts training in seven program categories, including...

Occupational Safety and Health

Fire Operations

Law Enforcement

Emergency Operations

Environmental and Waste Management

Transportation

Homeland Security

Neighboring Partners

Hanford Patrol Training Academy

- 10,000-Acre site
- Operated by Day & Zimmerman Protection Technology Hanford
- Seven firing ranges
- One tactical range
- Emergency Vehicle Operations Course (EVOC)

Neighboring Partners

Utility Training Center

- 80-Acre site
- Board of Directors includes:
  - DOE
  - Bonneville Power Administration
  - PNNL
  - Fluor Hanford
  - and Regional Power Utilities

Customer Base

- U.S. Departments of Energy, Defense, Homeland Security, Transportation, and Labor (OSHA)
- Other Federal Agencies and Contractors
- International Labor Unions
- State, Local, and Tribal Governments
- International Governments
- Private Industry

Success Through Safety

- HAMMER has had excellent success in the management of projects ranging from small ($K) to large ($M)
- HAMMER was awarded Star status in DOE's Voluntary Protection Program (VPP) in September 2002

Department of Energy
VPP

Ready for Hydrogen

HAMMER is uniquely qualified:

- DOE-owned facility
- Experience in hands-on training
- Experience in training program development and management
- Experience in design and construction
- Experience in facility operation and maintenance
- Extensive network of professional training and engineering resources

Ready for Hydrogen

- HAMMER is currently transitioning from the DOE Office of Environmental Management to the Office of Energy Assurance
- HAMMER has close partnerships with:
  - Department of Transportation
  - Bonneville Power Administration
  - Pacific Northwest National Laboratory
- HAMMER has professional, dedicated staff
- HAMMER truly exemplifies...

Training as Real as it Gets!

Vision for Training Facility

- Hands-on training with life-sized props
- Computer-based distance training
- Forum for:
  - Integration of federal players (mainly DOE and DOT)
  - Stakeholder interaction, learning, and feedback for safety improvements
- Training activities to protect people and property by:
  - reducing risks
  - preventing accidents
  - ensuring effective emergency response to potential accidents
- Stakeholders will be reassured that the hydrogen economy of the future will be just as safe as the fossil fuel economy of today.

Target Audiences for Safety Training

Classroom Training

- Regulators, city planners, and fire marshals
- Elected officials
- Educators

Hands-on Training with Props

- Fire departments
- Other first-responders (police, health care) to potential hydrogen fires
- Building code officials

Target Audiences for Safety Training (continued)

- Fleet managers for hydrogen fuel cell vehicles
- Hydrogen fueling station owners
- General public who are early adopters of hydrogen fuel cell vehicles

Equipment Demonstration and Testing

- Designers and manufacturers of:
  - hydrogen storage tanks
  - hydrogen leak-detection sensors
  - hydrogen production equipment
  - hydrogen fuel cells
  - hydrogen fuel cell vehicles

Draft Five-Year Roadmap

Year 1	►Design prop systems. ►Conduct 2 hydrogen safety training classes at HAMMER that do not require props.
Year 2	►Construct prop systems. ►Develop curriculum and plan demonstrations for hydrogen safety training using props.
Year 3	►Modify/improve prop systems as needed. ►Develop videoconference and web-based hydrogen safety training modules. ►Deliver additional hydrogen safety training classes.

Draft Five-Year Roadmap (continued)

Year 4	►Modify/improve prop systems as needed. ►Conduct hydrogen safety training classes for almost all identified audiences. ►Purchase modest size reformer to produce hydrogen at HAMMER.
Year 5	►Produce hydrogen safety tips CD/DVD for all new hydrogen vehicles. ►Conduct hydrogen safety training classes for all audiences, including early adopters of hydrogen vehicles among the public. ►Purchase hydrogen vehicle and hydrogen fueling station for hands-on demonstration of fueling safety.

Three Conceptual Prop Systems

- ***High-Pressure H_2 Gas Storage Tank***
  - high-pressure hydrogen gas storage tank, valves, and piping
  - enclosed structure that can be vented or sealed up
  - high-pressure and low-pressure leaks, with and without ventilation
  - demonstrates:
    - operation of pressure relief device
    - hydrogen buoyancy properties
    - hydrogen flame characteristics
- ***H_2 Vehicle/Gasoline Vehicle Accident***
  - accident between hydrogen vehicle and gasoline vehicle
  - hydrogen storage tank, valves, piping, and gasoline storage tank
  - release of hydrogen due to gasoline tank fire
- ***Bulk Liquid H_2 Storage Tank***
  - 10,000-psig bulk liquid hydrogen storage tank
  - ability to simulate variable leak rates
  - flame source

Seeking Input

- Which audiences most urgently need hands-on hydrogen safety training?
- What training points should be emphasized for each audience?
- Feedback on the three conceptual prop systems?
- What other prop systems are needed?
- Additional input for National Training Facility?

Conclusions

What we want from you:

- Input on urgent hydrogen safety training needs
- Feedback on three conceptual prop systems

What's in it for you:

- Opportunity to get your ideas incorporated into the National Training Facility for Hydrogen Safety

What to do:

- Attend Education/Training Breakout Session @1:30 p.m. tomorrow and provide input on training needs and prop systems.
- Feel free to contact us later with your input.

Closing Thoughts

HAMMER can play a key role in creating the hydrogen economy by providing safety training in a realistic environment to inspire stakeholder confidence in hydrogen and fuel cell technologies.

Desired Outcome --- Stakeholders will be reassured that the hydrogen economy of the future will be just as safe as the fossil fuel economy of today.

Contacting Us

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